

Crystal Data: Cubic. *Point Group:* $2/m\bar{3}$. As grains, to 1 mm, and intergrown with hollingworthite or laurite.

Physical Properties: *Tenacity:* Brittle. Hardness = Not scratched with a steel needle. VHN = 976 D(meas.) = n.d. D(calc.) = 11.92

Optical Properties: Opaque. *Color:* Iron-black; in polished section, grayish white with a bluish tint. *Luster:* Metallic.
R: (400) 47.6, (420) 47.3, (440) 47.0, (460) 46.8, (480) 46.6, (500) 46.4, (520) 46.2, (540) 45.9, (560) 45.6, (580) 45.4, (600) 45.1, (620) 44.9, (640) 44.6, (660) 44.3, (680) 44.0, (700) 43.7

Cell Data: *Space Group:* $Pa\bar{3}$. $a = 5.777$ $Z = 1$

X-ray Powder Pattern: Onverwacht mine, South Africa.

3.32 (100), 2.87 (100), 1.74 (100), 2.04 (90), 1.112 (90), 2.57 (80), 1.021 (80)

| Chemistry: | (1) | (2) | (3) | | (1) | (2) | (3) |
|-------------------|------|------|-------|-------|------|------|--------|
| Ir | 23.0 | 43.5 | 62.35 | Pd | | 0.4 | |
| Ru | 9.4 | 5.5 | | Cu | | 0.6 | |
| Rh | 7.2 | 1.4 | | As | 34.5 | 26.0 | 26.60 |
| Pt | 12.6 | 11.7 | | S | 11.6 | 9.6 | 11.47 |
| | | | | Total | 98.3 | 98.7 | 100.42 |

(1) Driekop mine, South Africa; by electron microprobe, corresponding to $(\text{Ir}_{0.29}\text{Ru}_{0.23}\text{Rh}_{0.17}\text{Pt}_{0.16})_{\Sigma=0.85}\text{As}_{1.12}\text{S}_{0.88}$. (2) Papua New Guinea; by electron microprobe, corresponding to $(\text{Ir}_{1.01}\text{Ru}_{0.03}\text{Fe}_{0.02}\text{Os}_{0.01})_{\Sigma=1.07}\text{As}_{0.89}\text{S}_{1.11}$. (3) Ioma placer, Shetland Islands; by electron microprobe, corresponding to $\text{Ir}_{0.91}\text{As}_{1.00}\text{S}_{1.00}$.

Polymorphism & Series: Forms a series with hollingworthite.

Mineral Group: Cobaltite group.

Occurrence: In chromite in hortonolite dunite (South Africa); as inclusions in chrompicotites (Bulgaria); and as rims around Pt-group alloys.

Association: Platinum, ruthenian hollingworthite, sperrylite, laurite, iridarsenite, ruthenarsenite, rutheniridosmine, chalcopyrite, chalcocite, pyrrhotite, cobaltite, gersdorffite, pentlandite, nickeline, magnetite, chromite, olivine.

Distribution: In South Africa, in the Merensky Reef, Bushveld complex, Transvaal, from the Onverwacht [TL] and Driekop mines. At the Hitura Ni–Cu deposit, western Finland. From Vourinos, Greece. In the Pletene chromite deposit, Bulgaria. From the Kapitanov chromite deposit, near Zvenyhorodka, Ukraine. At Chromwerk, Kraubath ultramafic massif, Styria, Austria. In the Cliff and Harold's Grave quarries, Shetland Islands. In the USA, from the American River, Sacramento Co., and in the Stanislaus River near Knight's Ferry, Stanislaus Co., California; from Fox Gulch, Goodnews Bay, Alaska. In Canada, at Werner Lake and Sudbury, Ontario, and the Pipe mine, in Manitoba. From the Anduo chromite deposit, Tibet, China. At the Baimka placers, Chukota, Far Eastern Region, Russia. From the Ioma placer, Waria River, Yodda goldfield, Papua New Guinea.

Name: For IRidium and ARSenic in the composition.

Type Material: n.d.

References: (1) Genkin, A.D., N.N. Zhuravlev, N.V. Troneva, and I.V. Murav'eva (1966) Irrarsite, a new sulfarsenide of iridium, rhodium, ruthenium, and platinum. *Zap. Vses. Mineral. Obsch.*, 95, 700–712 (in Russian). (2) (1967) *Amer. Mineral.*, 52, 1580 (abs. ref. 1). (3) Tarkian, M. and H.M. Prichard (1987) Irrarsite-hollingworthite solid-solution series and other associated Ru-, Os-, Ir-, and Rh-bearing PGM's from the Shetland ophiolite complex. *Mineralium Deposita*, 22, 178–184. (4) Cabri, L.J., Ed. (1981) *Platinum group elements: mineralogy, geology, recovery*. *Can. Inst. Min. & Met.*, 110–111. (5) Criddle, A.J. and C.J. Stanley, Eds. (1993) *Quantitative data file for ore minerals*, 3rd ed. Chapman & Hall, London, 252.

All rights reserved. No part of this publication may be reproduced, stored in a retrieval system or transmitted in any form or by any means, electronic, mechanical, photocopying, recording, or otherwise without the prior written permission of Mineral Data Publishing.